

THUNDER Air Tasking Order Generation



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April 1997



Overview

- **Key Concepts**
- **Relationship to Joint Doctrine**
- **Basic Process**
- **Types of Missions Available**
- **Mission Prioritization**
- **Tracking ATO Generation**



Key THUNDER ATO Concepts

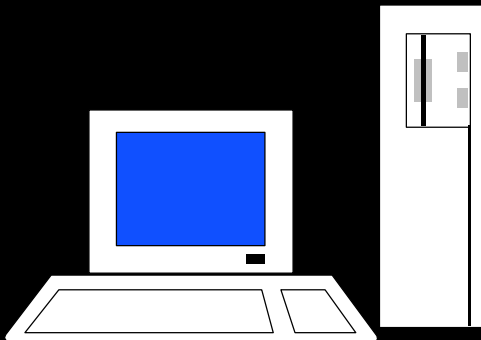
- **Normally, THUNDER missions are categorized by the type target attacked, rather than the type aircraft accomplishing the mission**
- **Things in THUNDER may be different targets on different days, depending on what they're doing**
 - **Example: an enemy ground unit may be an interdiction or CAS target, depending on where it is and what it's doing**
- **THUNDER mission generation is target-based rather than geographically-based**
- **There is not necessarily a guarantee that an ATO mission will actually achieve desired results**



THUNDER ATO Generation Represents Complicated Real-World Process



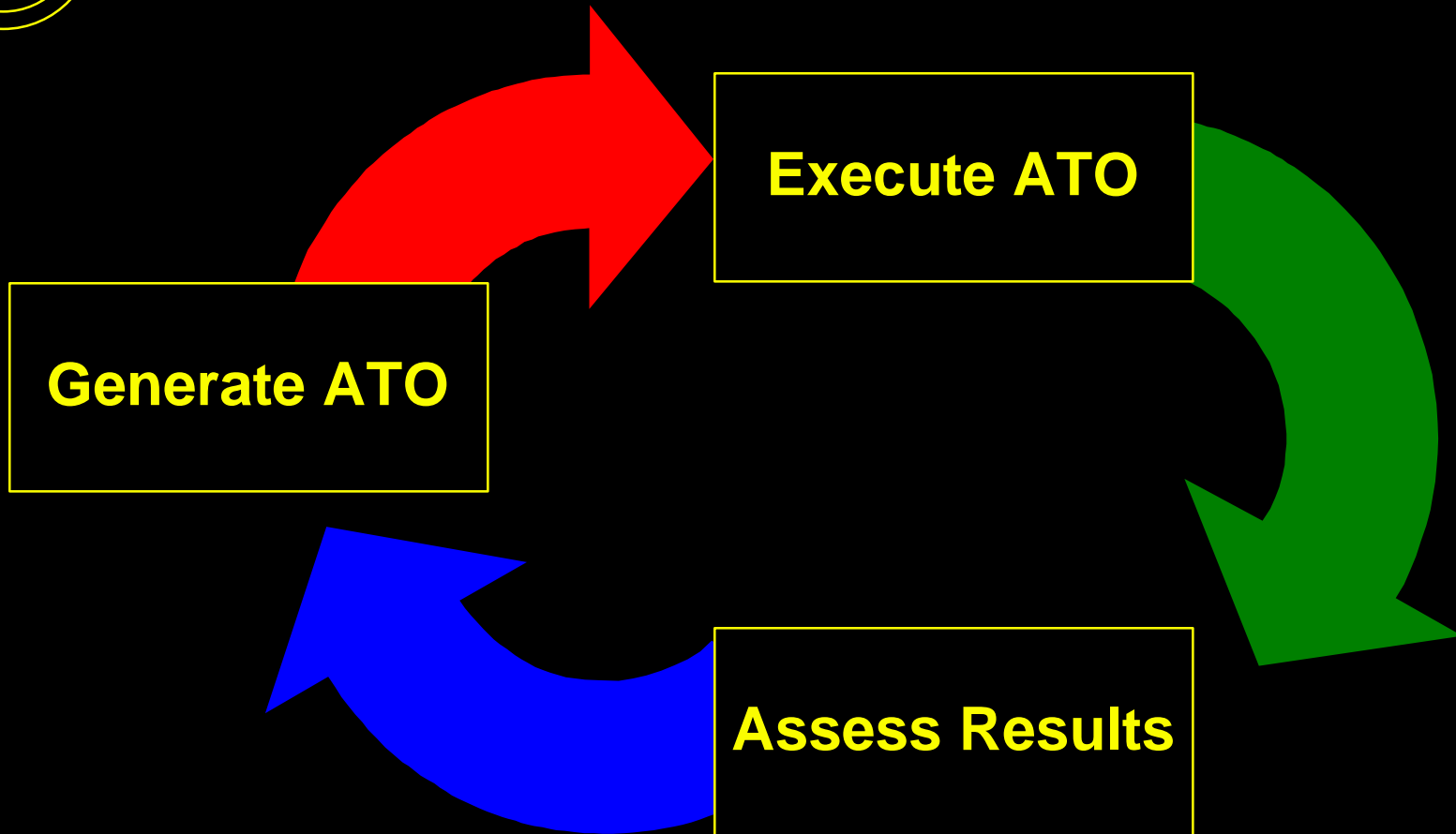
- “Getting out the frag”
 - 50+ people
 - 24 hour process



- THUNDER ATO
 - Computer simulation
 - Normally less than 1 minute of CPU time



Relationships of Major Tasks





Relationship to Joint Doctrine

- **THUNDER ATO generation process follows steps outlined in JPub 3-56.1 “Command and Control of Air Operations”**
 - **Model performs functions of Joint Air Operations Center (JAOC)**
 - **Generates ATO with explicit representation of each aircraft sortie, target, TOT, and weapon**
- **Variable cycle length**



Basic Steps of Process

Apportionment

% of sorties to missions



Allocation

*Actual number of sorties
to squadrons*



Distribution

Missions to targets



Simplified Example of ATO Generation Process

- **Given: Available aircraft sorties from 3 squadrons:**

A-10 Squadron	18 aircraft	28 sorties
Tornado Squadron	15 aircraft	20 sorties
F-18 Squadron	12 aircraft	24 sorties
TOTAL ==>		72 sorties

- **Given: JFC approved apportionment:**

CAS	40%
Interdiction	30%
Afld Attack	30%



ATO Generation (2)

- JFC apportionment yields following sortie breakdown of the 72 available sorties:

CAS	40%	==>	28 Sorties
Interdiction	30%	==>	22 Sorties
Afld Attack	30%	==>	22 Sorties

- Which translated to this sortie allocation:

	Available	CAS	Inter	Afld Attk
A-10 Squadron	28 sorties	28		
Tornado Squadron	20 sorties		20	
F-18 Squadron	24 sorties		2	22
	
Totals==>		28	22	22



ATO Generation (3)

- After sorties are allocated to a given mission class, the sorties are assigned highest priority targets within that specific mission class
- Example:

Interdiction Target 1	4 Sorties	Assigned
Interdiction Target 2	8 Sorties	Assigned
Interdiction Target 3	8 Sorties	Assigned
Interdiction Target 4	2 Sorties	Assigned
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Interdiction Target 5	2 Sorties	Not Assigned
Interdiction Target 6	4 Sorties	Not Assigned



Types of Missions Available in THUNDER

Role	Mission	THUNDER Mission
Aerospace Control	Offensive Counterair	FSWP, OCA, AIRESC
	Defensive Counterair	DCA, BARCAP
	SEAD--Destructive	ESUP, CSUP, SSUP, DSEAD
	SEAD--Disruptive	EJAM, CJAM, SJAM
	Offensive Counterspace	OTBM
	Defensive Counterspace	DTBM
Force Application	Strategic Attack	STI
	Interdiction	INT, BAI
	Close Air Support	CAS, BAI
Force Enhancement	Air Refueling	AAR
	Surveillance	AEW
	Reconnaissance	SREC, RECCE



Mission Prioritization

- Often times, the number of available targets to be attacked or mission to be flown exceeds the sortie resources available
- THUNDER ATO generation process uses a variety of prioritization methods to determine which targets are attacked
 - Exact method varies by mission
- In the event targets in a given mission area are exhausted, the user also has option of allowing ATOs to be generated against alternate targets (“trickle down” mission planning)



Prioritization of THUNDER Missions

Air-to-Air

- **AIRESC** prioritized by user defined rules about strike mission importance and length of time in enemy airspace
- **FSWP** prioritized by number of missions flown in given sector, possibly subject to user defined rules that filter out shallow penetration missions
- **BARCAP** prioritized by user defined rules about area or facilities to protect
- **DCA** launched to attack enemy strikes which penetrate user set distances
 - Both **BARCAP** and **DCA** missions cause ground based defenses in flight's area to go "weapons hold"



Prioritization of THUNDER Missions

Air-to-Ground

- **CAS prioritized by user defined rules about supporting success or failure**
- **BAI also prioritized by user defined rules about supporting success or failure**
 - **Can attack second echelon or combat support units**
 - **User defined rules about which type of unit to attack**
- **OCA (airbase attack) prioritized by user defined rules about importance of aircraft stationed at a base**
- **STI prioritized by user defined target prioritization list**
- **INT missions prioritized by user defined rules based on type targets attacked**



Prioritization of Interdiction Targets

- **Units**
 - Based on strength, time to destination, vulnerability, and % damage already sustained
- **Logistics Facilities**
 - Amount of supplies shipped and amount remaining in storage
- **Chokepoints and Transshipment Points**
 - Throughput in previous cycle (by weight)
 - “Look ahead” for units only
- **Communications Facilities**
 - Message traffic
- **Supply trains**
 - Size, time to destination
- **Air defense complexes**
 - User defined importance



Prioritization of SEAD Support Missions

- **Escort missions use similar logic to AIRESC**
 - **User defined rules about strike mission importance and exposure to threat**
- **Standoff support missions attempt to maximize the number of packages supported through SEAD corridors during defined time windows**
- **SEAD can also be controlled by aircraft type**
 - **Example: Stealthy airplanes may have lower priority for support than conventional airplanes**



Prioritization of Other Support Missions

- **AEW, SREC**
 - Aircraft attempt to fill defined orbits and station times
- **RECCE**
 - Aircraft attempt to go to areas where perception is lowest
- **AAR**
 - Tankers go to defined orbit points
 - Enough tankers are launched to fill offload demand



Counter-TBM Missions

- **Two types available**
 - **DTBM -- attack airborne missiles**
 - **OTBM -- attack TELs and missile sites**
- **Both DTBM and OTBM orbits use similar logic as other standoff assets**
 - **Attempt to fill defined orbit point and times**
 - **DTBM engages missiles from orbit**
 - **OTBM must be committed out of orbit based on external sensor detecting TEL activity or launch**



Tracking ATO Generation

- **Various reports available to monitor ATO generation process**
 - **Show things such as sorties available, scheduled, target prioritization as well as actual ATO**
- **Helps gain insights into planning process**



Final Thoughts

- **THUNDER ATO generation process is among the more challenging aspects of THUNDER use**
 - **Entire day is devoted to this subject in Advanced THUNDER Course**

“THUNDER is a sharp edged tool” (Bob Larkin)

- **This briefing has only covered the basics and top level overview**
- **Understanding process requires effort on part of user**